UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,405	05/18/2006	Gregory D. Plowman	EX03-077C-US	5781

63572 7590 11/01/2007

MCDONNELL BOEHNEN HULBERT @ BERGHOFF LLP
300 SOUTH WACKER DRIVE
SUITE 3100
CHICAGO, IL 60606

EXAMINER	
NATARAJAN, MEERA	
ART UNIT	**PAPER NUMBER**
1643	
MAIL DATE	**DELIVERY MODE**
11/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/532,405	PLOWMAN ET AL.	
	Examiner	Art Unit	
	Meera Natarajan	1643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) *2,3,12,13,21,22 and 24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 4-11, 14-20, 23 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *08/08/2005, 12/01/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, Claims 1-25 in the reply filed on 09/17/2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Applicant's election of the following species in the reply filed on 09/17/2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the species election has been treated as an election without traverse (MPEP § 818.03(a)).

a. Assay – cell proliferation assay

b. Assay system – matrix implant assay

c. Agent – nucleic acid modulator

3. After further consideration the species election for "Assay system" has been extended to include the following species:

d. Assay system: xenograft assay, a hollow fiber assay, transgenic tumor assay

4. Claims 26-33 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 09/17/2007

5. Claims 2-4, 12, 13, 21, 22 and 24 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 09/17/2007.

6. Claims 1, 5-11, 14-20, 23 and 25 will be examined on the merits.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 1, 5-11, 14-20, 23 and 25 are rejected under 35 U.S.C. 103(a) as being obvious over Francis-Lang et al. (WO/2004/024888) in view of Haq et al. (Genomics Vol. 71, pp.131-141, 2001) and Muraoka et al. (Journal of Cell Biology, Vol. 153, pp.917-931, 2001).

The applied reference (WO/2004/024888) has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

10. The claims are drawn to a method of identifying a candidate branching morphogenesis modulating agent by providing an assay system comprising a cyclin-dependent like 1 (CDKL1) polypeptide or nucleic acid and contacting said assay system with a nucleic acid modulator (PMO) and determining the activity or expression of CDKL1 polypeptide or nucleic acid in the assay system, wherein a change in the activity or expression of CDKL1 polypeptide or nucleic acid between the presence or absence of said nucleic acid modulator indicates the presence of a candidate branching morphogenesis modulating agent. The method involves detecting changes in a cell

proliferation assay comprising cultured cells and in a xenograft assay, a hollow fiber assay, or a transgenic tumor assay comprising a mouse comprising a RIP1-Tag2 transgene.

11. Francis-Lang et al. (WO/2004/024888) teach a method of identifying genes that modify the p21, p53, or branching morphogenesis pathway in Drosophila, and identified their human orthologs referred to as WHN (Winged helix nude). The methods for utilizing these p21, p53, or branching morphogenesis modifier genes and polypeptides to identify WHN- modulating agents that are candidate therapeutic agents that can be used in the treatment of disorders associated with defective or impaired p21, p53, or branching morphogenesis function (see p. 4 lines 20-26). Francis-Lang et al. teach nucleic acid modulators such as antisense oligomers, for example phosphothioate morpholino oligomer (PMO) (see p. 20 lines 20-23) and RNAi that repress WHN gene expression or product activity (see. p. 4 lines 27-30). Claims 1, 5, 6, 8-11, 13, and 16-18 of Francis-Lang et al. disclose similar method steps and limitations of the instant application. Claim 1 of Francis-Lang et al. teach "a method of identifying a candidate p21, p53, or branching morphogenesis pathway modulating agent, said method comprising the steps of: (a) providing an assay system comprising a purified WHN polypeptide or nucleic acid or functionally active fragment or derivative thereof; (b) contacting the assay system with a test agent under conditions whereby, but for the presence of the test agent, the system provides a reference activity; and (c) detecting a test agent-biased activity of the assay system, wherein a difference between the test agent-biased activity and the reference activity identifies the test agent as a candidate p

21, p53, or branching-morphogenesis pathway modulating agent" (see Claim 1 on p. 41). The method disclosed in Francis-Lang et al. teach a PMO nucleic acid modulator (see Claim 8-10 on p41-42 of WO document), a cell proliferation assay (see claim 6 on p. 41 of WO document), matrix implant assay, xeongraft assay, hollow fiber assay, and a transgenic tumor assay that includes a mouse comprising a RIP1-Tag2 transgene (see p. 31-33). Francis-Lang et al. does not teach an assay system comprising a CDKL1 polypeptide or nucleic acid.

12. Haq et al. teach mitogen –activated protein kinases (MAPKs) and cyclin-dependent kinases (CDKs) are key mediators of cell proliferation, cell division, and cell differentiation. The cyclin-dependent kinase-related family of kinases is a growing collection of molecules with sequence similarity to the CDKs (see p. 132, top left column).

13. Muraoka et al. teach cyclin-dependent kinase inhibitor $p27^{Kip1}$ is required for mouse mammary gland morphogenesis and function. Muraoka et al. teach loss of p27kip1 may result in unrestrained cellular proliferation and that $p27^{Kip1}$ is required for mammary gland development. These findings indicate that a cyclin-dependent kinase inhibitor, $p27^{Kip1}$, supports a model for the role of p27 in both activation and inhibition of cell cycle progression and demonstrate a critical role for p27 in regulation of mammary epithelial proliferation, morphogenesis, and function (see p. 930, last sentence, right column).

14. It would have been *prima facie* obvious to one of ordinary skill in the art at the time the claimed invention was made to perform a method of identify candidate

branching morphogenesis modulator agents as taught by Francis-Lang et al. in an assay system comprising a cyclin-dependent kinase like 1 (CDKL1) polypeptide or nucleic acid. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success by teachings in Francis-Lang et al., Haq et al. and Muraoka et al. because Haq et al. teach CDK like molecules share structural and functional features and Muraoka et al. teach cyclin-dependent kinases play a role in branching morphogenesis and agents that can inhibit cyclin-dependent kinases can modulate cell proliferation, morphogenesis and function. Therefore, it would be obvious to substitute one cyclin dependent kinase for another cyclin dependent kinase in the same family of molecules to identify different modulating agents.

Conclusion

15. Claims 1, 5-11, 14-20, 23 and 25 are rejected.

16. No claim is allowed.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Meera Natarajan whose telephone number is 571-270-3058. The examiner can normally be reached on Monday-Thursday, 8:30AM-6:00PM, ALT. Friday. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Helms can be reached on 571-272-0832. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MN

LARRY R. HELMS, PH.D.
SUPERVISORY PATENT EXAMINER